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14. ABSTRACT

Lockheed Martin Aeroparts, Johnstown, PA received a contract to manufacture 96 weapons pylons for USAF F-16 upgrades. There are expectations of a follow-on order for 198 additional units. The pylon is made from an aluminum casting and requires machining in five different positions. In-process inspection via Non-Destructive Testing (NDT) using Liquid Penetrant (LP) is also required. Because the component has multiple critical features controlled by close tolerances, the part must be NDT inspected while remaining in the fixture to assure the component does not move. Due to the complex shape of the part, stability and rigidity were of great concern in the tool design process. Problems occurred when attempting to relocate and NDT inspect the component. The operation was very cumbersome and timeconsuming. Lockheed Martin asked the National Center for Defense Manufacturing and Machining (NCDMM) to provide or recommend a solution to reduce the setup time and locating effort required.

15. SUBJECT TERMS
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F-16 HARM Targeting Pod

NCDMM Project No. 04-0035-03

Technical Report

PROBLEM / OBJECTIVE

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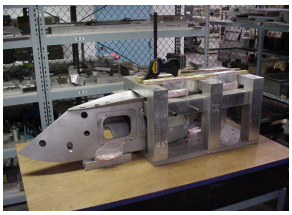
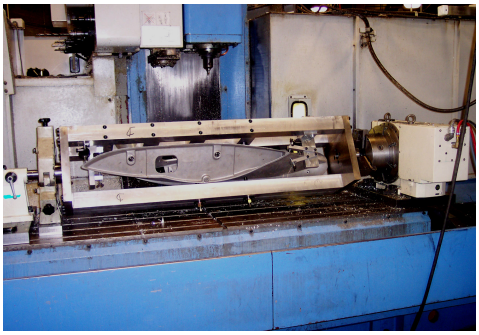


Old Clamping Method



New Method with 4th Axis Rotary Table

ACCOMPLISHMENTS / PAYOFF

Process Improvement

A meeting was held at Lockheed Martin in Johnstown to review all critical clamping issues. The team agreed that redundant fixturing would be needed to accomplish these requested goals. The concept that had the most value to the team was to find a method to clamp a fixture between centers and rotate it with a 4th axis rotary table. Two fixtures, built and assembled by McCullough Machine, would be used so one could be setup while the other was in the machine. Indicators were installed at various locations on the fixture to monitor part movement while clamping.

Implementation and Technology Transfer

The following process and tool recommendations were made to Lockheed Martin in Johnstown:

- Addition of a 4th axis rotary table on Lockheed Martin's current Mazak machine
- Utilization of indicators to locate casting in fixture and monitor movement
- Provision of ability to remove fixture from machine while NDT is performed
- Reduction of clamping steps to one per part

Expected Benefits

Lockheed Martin can now complete a part in only one clamping setup. Operators can monitor for part movement while utilizing the increased stability provided by the newer fixture, as well as the accessibility to all sides of the part that requires machining

Lockheed Martin is expected to process nearly 300 of these targeting pylons by 2008. This new fixture will allow the program to meet budget constraints by reducing costs by approximately $95,000.00.

TIME LINE / MILESTONE

Start Date.....May 04
Recommendations Made.....June 05

PROJECT FUNDING

NCDMM funding $45K

PARTICIPANTS

NCDMM
McCullough Machine

For additional information concerning this project, contact the NCDMM at www.ncdmm.org